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Addressing the IS Enrollment Crisis: A 12-step Program to Bring about Change through the Introductory IS Course

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Abstract:

An enrollment crisis continues to plague the Information Systems (IS) discipline. Although recent studies have begun to offer several potentially profitable strategies to reverse plummeting student enrollments, little evidence has been put forth to document comprehensive intervention initiatives aimed at attracting students in higher education institutions. To this end, this study describes a 12-step program targeted at the introductory IS course at one such institution. Developed based on empirical evidence from the literature, discussions with our IS colleagues, and best practices at other institutions, the 12-step program covers all aspects of the course including faculty assignment, tenor and approaches used in class, and innovative ways to tell the IS story. As a result of implementing the program, enrollments in core upper-division IS courses at the institution doubled. This paper presents a powerful, integrated program that is replicable and can be used by other IS departments to address the enrollment crisis at their institutions.

Keywords: enrollment crisis, intervention strategies, 12-step program

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I. INTRODUCTION

The information systems (IS) discipline is faced with an enrollment crisis. Since 2002, the discipline has witnessed severely declining enrollments, estimated to be as high as 50 percent [George et al. 2005]. The detrimental effects of declining enrollments has dramatically affected the IS community, as evidenced by the fact that the Association for Information Systems (AIS) president has highlighted "The Enrollment Crisis" during the president's address to both ICIS 2006 and 2007, as well as encouraged a community-wide discussion through a newly established wiki on the topic (<http://enrollments.aisnet.org>). Plummeting enrollments is one of five items the current AIS president has promised to address [Galletta 2007]. In many ways, the predicament is surprising because of the powerful role technology plays in contemporary organizations and society. More specifically, in recent times globalization has quickly become the dominant force. In this "flat world" [Friedman 2005], IS enrollments should be thriving, as the field is uniquely positioned to make substantive contributions during this remarkable time in history.

As this crisis persists, a diverse mix of scholars has suggested potentially profitable strategies aimed at curtailing declining enrollments. These recommendations target the introductory IS course, as most students enrolled in these courses have yet to declare a major [George et al. 2005; Akbulut and Looney 2007]. Scholars have recommended interventions such as exposing students to interesting and contemporary technologies [George et al. 2005], assigning effective teachers to introductory courses [Looney and Akbulut 2007], and using peers to promote the rewards that arise from majoring in IS [Akbulut and Looney 2007]. Although these efforts have yielded several noteworthy discoveries, little information has been put forth to document comprehensive intervention initiatives that have successfully reversed plummeting student enrollments at higher education institutions. If the discipline is to advance toward the implementation of effective strategies to combat declining enrollments, it is imperative to use a holistic approach that addresses the content, structure, resources, and tone employed in the introductory IS course. In fact, the continued success of the IS discipline depends upon it [George et al. 2005].

Accordingly, this paper addresses the following question:

Given the enrollment crisis afflicting the IS discipline, what comprehensive set of steps can be implemented in the introductory IS course to increase the number and quality of students entering the IS major?

Addressing this question has broad implications for the IS discipline. By implementing intervention strategies targeted at the introductory IS course, we believe our field can successfully rebound from the sharp decline in student enrollments. To this end, this article outlines a comprehensive 12-step program, which was effectively deployed in the introductory IS course to facilitate such change at one higher education institution, The University of Montana. After implementing the program, enrollments in core upper-division IS courses have doubled.

The remainder of the paper proceeds as follows. We begin by providing a background of the enrollment issues at The University of Montana, describing the former state of affairs in the introductory IS course and outlining the approach used to derive the 12-step program. We then describe each of the 12 steps, elucidating how and why the steps were implemented. Finally, based on our experiences, we discuss the results of the initiative and offer recommendations about how other higher education institutions can incorporate our lessons learned, adjusting their introductory IS courses to increase student enrollments.

II. BACKGROUND

The Introductory IS Course at the University of Montana

Like many higher education institutions, the IS program at The University of Montana experienced a sharp decline in majors following the dot.com bust. Referring to Figure 1, the bottom line (blue) shows the number of IS students enrolled in the 300-level database course. This course constitutes the first course a new IS major is required to complete en route to an IS degree. Typically, students take the course one year after passing the introductory IS course. As such, this class can be used as a gauge to assess the health of the IS major. As indicated by George et al. [2005], the decline (before we enacted the 12-step program described in this paper) mirrors enrollment trends at most IS programs in the United States. To put the enrollment decline in perspective, the top line (brown) depicts the number of business school students taking a required 300-level general business class, which must be completed



by all students striving to earn any business degree. Compared to IS enrollments, a slight downward trend for overall business school enrollment has been witnessed over the entire period.

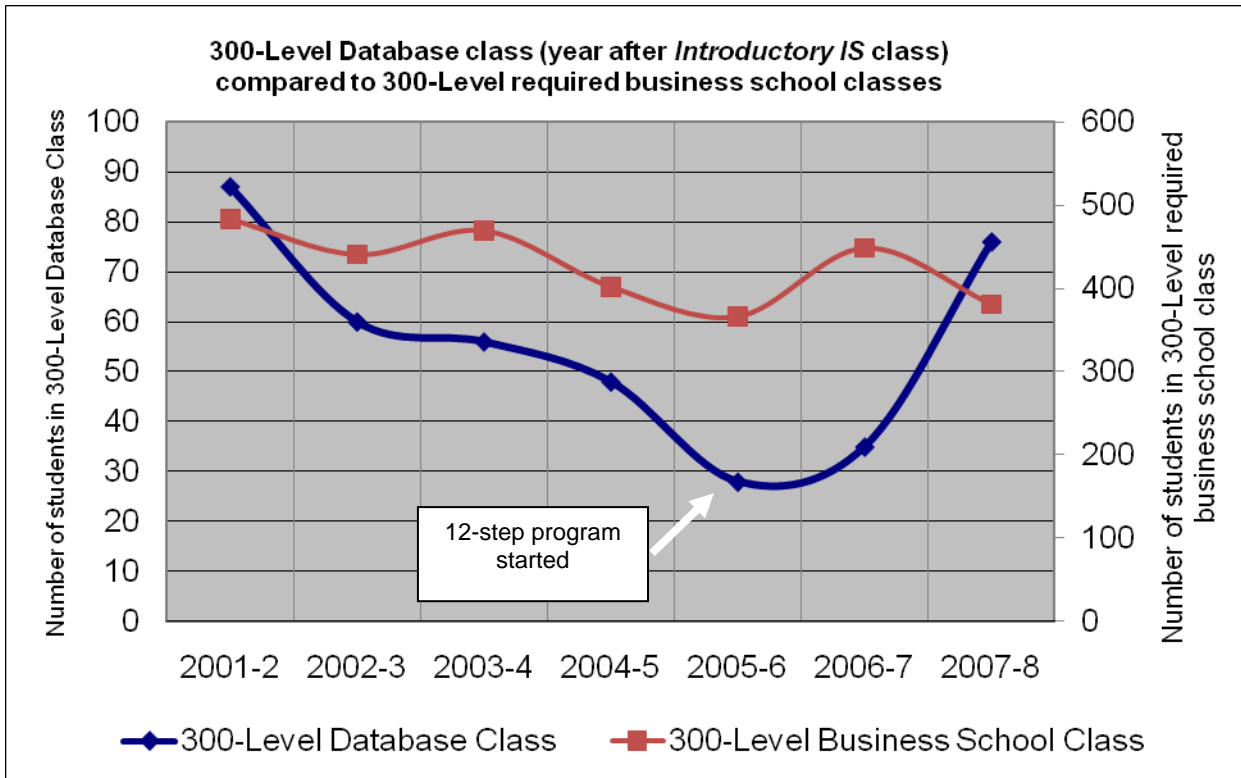


Figure 1. Enrollment Figures by Year

As a result of the decline in IS enrollments, in 2005 a committee was formed to conduct a comprehensive review of our introductory IS course. The goal involved identifying problem areas that were preventing additional students from majoring in IS. This initiative was appropriate considering that the introductory IS course typically represents an IS program's initial opportunity to expose students to the world of IS. Moreover, the majority of students enrolled in the introductory IS course had not formally declared a major [George et al. 2005; Akbulut and Looney 2007]. As a result, we strove to capitalize on a significant opportunity to direct students toward the IS major [George et al. 2005].

The committee's internal assessment started with a rather simple statement: "We have a structural problem with our introductory IS course in the business school." The problem was significant, as the introductory IS course was essentially a quantitative business applications class, or, as the students put it, "Excel for Business." Like most IS programs within business schools, all business students were required to take the introductory IS course [George et al. 2005], meaning that the course had the potential to make a significant impression on students. As a result of teaching "Excel for Business" rather than IS, the majority of students who completed the class believed that the essence of the IS discipline focused on quantitative modeling techniques. Students who eventually chose to major in IS typically possessed strong technical backgrounds, similar to the skills required to succeed in Excel for Business.

The structural problem with the Introduction to IS course highlighted the fact that IS was not being taught to our fledgling business students. Rather, students were subjected to topics that failed to reflect the essence of the discipline. As such, a tremendous opportunity to expose students to the world of IS was being wasted. In sum, a key structural problem precluded the program from leveraging the course to recruit students into the IS major [Akbulut and Looney 2007; George et al. 2005].

Deriving the 12-Step Program

The changes introduced in the introductory IS course were based on empirical evidence in the research literature, as well as discussions with colleagues at other institutions during the spring of 2006. Specifically, a thorough review of the IS, education, and psychology literatures were conducted to identify potentially fruitful intervention strategies. In addition, colleagues within the discipline were contacted for their insights, available IS introductory textbooks were closely scrutinized, and online teaching resources provided by the AIS were reviewed (to access available resources visit: <http://www.magal.com/iswn/teaching/intromis>). We also visited a very successful and progressive IS program to discover how their introductory IS course was being delivered.

Based on this preliminary groundwork, radical changes were introduced in the introductory IS course by implementing a set of 12 steps targeted at improving student enrollments. During the summer of 2006, the newly revised program was deployed across two class sections. Students were made aware that they were test subjects for changes that were being made, and continual feedback was sought from the students to refine these alterations. After successfully honing the 12-step program, a full-scale rollout commenced in fall semester of 2006. As depicted in Figure 1, by the spring 2008 semester, the number of students majoring in IS major had doubled, prompting the need to add additional sections of our core upper-division IS classes to cope with the dramatic enrollment increases.

III. THE 12-STEP PROGRAM

The 12-step program discussed herein addresses the “how” aspect of teaching the introductory IS course. For the most part, we leave the issue of course content to the committees responsible for the IS Core Curriculum [Gorgone et al., 2006; Topi et al. 2007]. The 12 steps, depicted in Figure 2 and summarized in the Appendix, form the basis for our discussion in this article. The 12 steps are summarized as follows:

1. Assign the most effective teachers.
2. Teach IS, not IT or CS.
3. Use writings from non-IS authors to tell the IS story.
4. Force the students to write and write.
5. Expose the students to innovative and interesting technology.
6. Recruit peers and alumni as guest speakers.
7. Expose students to career and internship counseling.
8. Provide sufficient levels of assistance to students.
9. Provide opportunities for reflective growth.
10. Identify and market to the top students.
11. Be nimble.
12. Focus on local strengths.

We describe each of the steps in the following subsections.

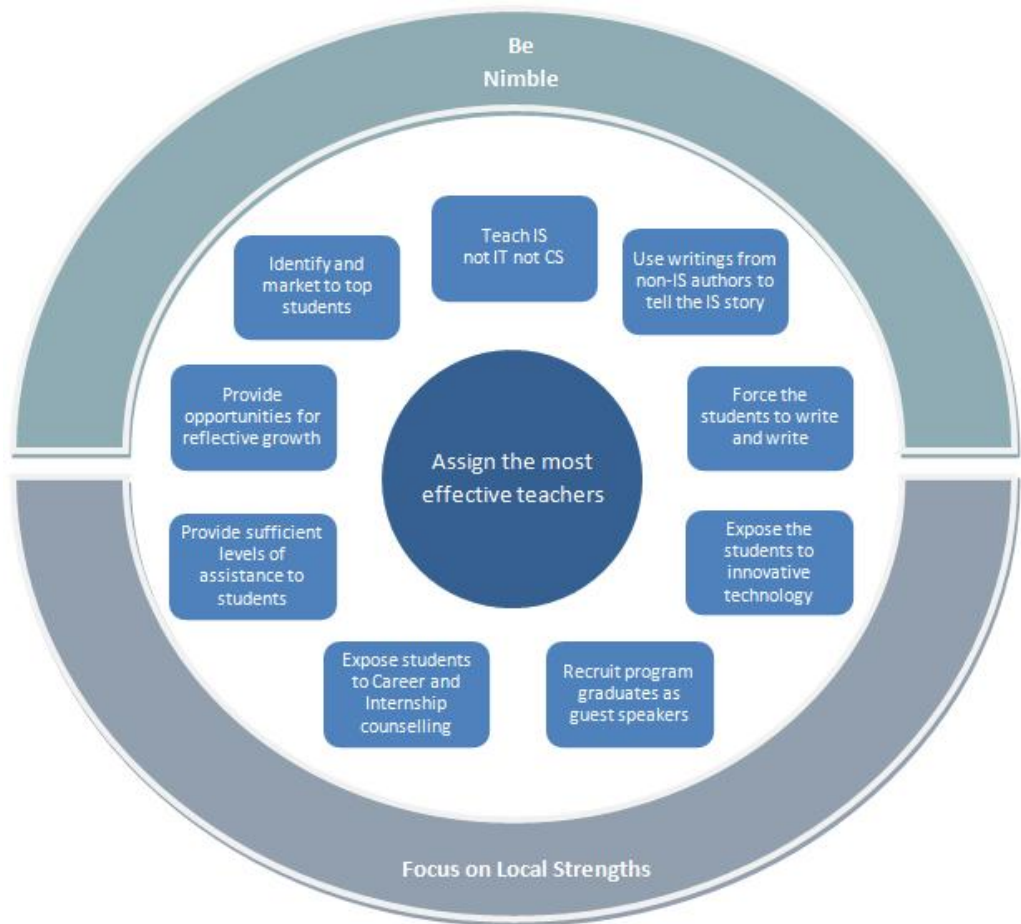


Figure 2. A 12-Step Program to Bring about Change Using the Introductory IS Course

Step 1: Assign The Most Effective Teachers to the Introductory Course

Effective teachers promote student learning [d'Apollonia and Abrami 1997; Looney and Akbulut 2007]. Consistent with prevailing thinking in the IS literature [George et al. 2005; Akbulut and Looney 2007], a recent study sampled students enrolled in a multiple-section introductory IS course, empirically supporting that “students who are taught by effective instructors are more likely to be attracted to the IS discipline” [Looney and Akbulut 2007, p. 781]. According to this rationale, effective instructors are able to bolster students' confidence in their ability to successfully pursue the IS major. Effective instructors are also able to raise students' expectations regarding the rewards that are likely to be derived by pursuing the IS major (covered in step 7 following), and pique student interest in the IS field. Confidence, heightened expectations, and interest, in turn, help students develop aspirations to pursue the IS major [Akbulut and Looney 2007; Looney and Akbulut 2007]. Consequently, assigning effective instructors to the introductory IS course represents the centerpiece of the 12-step program. Many of the other elements of the program are driven by this step.

For many higher education institutions, doctoral students or adjunct faculty teach the introductory IS course, enabling tenure-track faculty to teach the more interesting and focused parts of the IS curriculum that come later in a student's progression. Interestingly, this need not be the case. The literature shows that, since 2001, universities seeking new tenure-track faculty indicate “teaching MIS” as the top priority¹ [Everard et al. 2005]. Regardless of an instructor's stature, a critical element in a program's success requires that the most effective instructors be assigned to the Introduction to IS course. Most students in the introductory IS course are in their sophomore (second) year in college. Many of these students may not be aware of the difference between doctoral student, adjunct, and tenure-track positions. Therefore, when selecting the most effective instructors, programs should not be concerned about an instructor's position. Rather, feedback from students at The University of Montana indicate that key determinants of effective instructors are derived not only from an ability to facilitate student learning [Looney and Akbulut 2007], but also from an ability to engage students. In essence, students consider effective teachers to be fair in their dealings with students, to be able to build a strong rapport with students, and to encourage students to share ideas and knowledge. Clearly, these traits are independent of the level or position of the instructor.

To identify our most effective teachers, a three-item scale measuring teaching effectiveness [Looney and Akbulut 2007] was administered at the end of the spring 2006 semester to students in every IS course. Using average item scores, the teachers who were rated the highest by students were identified. Teaching assignments were then adjusted, placing our most effective teachers in the introductory IS course.

Step 2: Teach IS, not IT or CS

Undergraduate business students associate a surprisingly diverse number of misconceptions and stereotypes about the field of IS [Enns et al. 2006; Joshi and Schmidt 2006]. In our introductory IS course, we start the first day with an exercise. Students are asked to write two or three paragraphs in response to the question “What is IS?” We make it clear that responses will not be graded, as we do not expect them to precisely know the answer at this juncture. The following comments reflect typical student responses:

From what I know, Information Systems involves developing new software/hardware.

The field of Information Systems consists of fields related to computers in the workplace, such as printers, faxes, monitors and so on.

Information System is a computerized business course that is designed to improve your computer skills in the business world.

To be completely honest I have no clue what IS is but I will definitely guess. IS could be the information necessary for computers to function correctly and the engineering that works with the information.

Almost all responses tell the same story: students erroneously believe that the IS discipline focuses on computers, programming, and technology. The second step in the 12-step program involves dispelling these myths, misconceptions, and stereotypes. At every opportunity, we emphasize that the IS discipline neither focuses on Information Technology (IT) nor Computer Science (CS). Rather, instructors emphasize the role information plays in business, in society, and among individuals. Porter and Miller [1985] coined the term *information intensity* to describe the extent to which information is important to a product, service, business process, or business relationship [Salisbury et al. 2004]. By considering information intensity, we free ourselves from rapidly changing

¹ Although in 2003 “teaching MIS” fell to 5th place being replaced by e-commerce as the top priority

technology, enabling us to focus on products, services, business processes and business relationships, which are more enduring.

The notion of information intensity also serves as a stepping stone to future classes in our core upper-division curriculum, placing seeds in our students' minds about the value of the IS major. We discuss the fact that information intensity is pervasive, even in the students' lives (e.g., cell phones, MP3 players, YouTube). Managing this information intensity requires increasingly large and more sophisticated databases. At this point, we describe the database class and how the topics covered therein will enable students to manage increasing levels of information intensity, which impacts every aspect of their professional and personal lives.

In addition, analogies have helped our students more precisely understand the distinctions between IS, IT, and CS. For example, one of our instructors compares IS, IT, and CS to NASCAR (many similar comparisons can be made, for instance to Formula 1 in Europe and South America). The story proceeds as follows.

CS can be viewed as the engineers, who design and build the race car. Without careful consideration of all design elements, an effective car cannot be built. Great computer scientists are needed to design and build quality software. By itself, a well-built race car is of no use unless the car is adequately maintained. Similarly, quality software can be written, but never used because it runs on the wrong technology or fails to be adequately supported. In the NASCAR version, the pit crew ensures that the well-designed race car is properly maintained. For example, the pit crew installs the correct tires for the track conditions, and fills the tank with the optimal amount of fuel to achieve the race strategy. In essence, the pit crew optimizes the race car for the situation and context. The same analogy holds true for IT. The goal of IT involves optimizing the technology so that the software runs exactly as an organization needs it to. Finally, we liken IS to the driver, who takes all the glory. The driver utilizes the well-designed and well-maintained software to its maximum, ensuring that the highest possible business value is extracted. Even the best driver will find it difficult to win the race without a well-designed and perfectly tuned race car. The same concept holds true with IS. We do not claim that IS is superior to IT or CS. Rather, each element plays a critical role in winning the race. Describing the interdependent nature of IS, IT, and CS instills a thorough understanding of their distinctive roles and the true nature of the IS major.

Finally, we reinforce the point that studying IS does not necessarily prepare students to execute a set of discrete technical tasks, such as calculating formulas in Excel. Instead, an IS education equips students with a powerful lens that enables them to gain important insights into organizations and our larger society.

Beyond students, some of our more technology-focused faculty seem to struggle with the distinction between IS, IT, and CS. This is particularly true when emerging technologies appear in the marketplace. However, such a focus leads toward the implementation of specific technical applications [Salisbury et al. 2004], which might have applicability in only particular circumstances or only for a relatively brief period of time. Therefore, it is essential that each instructor understands the distinction before entering the classroom.

Step 3: Use Writings from Non-IS Authors to Tell the IS Story

In the introductory IS course, we introduce four non-IS authors to tell the IS story. As the ISWorld post by Dillon-Merrill [2006] noted, Thomas L. Friedman's *The World Is Flat* provides an exceptional portrayal of the critical role that IS and IT play in our increasingly globalized society. Therefore, we require students to read a short synopsis of *The World Is Flat* [Friedman 2005]. We emphasize that the book version has been on the *New York Times* Bestseller list for over two years and the author, who is a foreign affairs columnist for the *New York Times*, has won the Pulitzer Prize three times. Of greater importance, we demonstrate how Friedman's vision articulates the essence and importance of the IS discipline in the clearest possible terms. In our judgment, Friedman's flat world encapsulates the field of IS.

In addition to Friedman [2005], the course incorporates Chris Anderson's *The Long Tail* [2006], Nick Carr's *The End of Corporate Computing* [2005], and Clayton Christensen's *The Rules of Innovation* [2002]. It should be noted that the four articles will not be used in perpetuity (see Step 12: Be Nimble). Friedman was selected because of his enduring significance in the business world, and the fact that his vision speaks directly to the use of IT to further IS, and how important both will be in the globalized future. Anderson, the editor in chief of *Wired* magazine, was chosen because *The Long Tail*, where little volume and many choices exist at the tail of the demand curve, constitutes a byproduct of IS. Because more choices exist for consumers as a result of IS, business must understand how to exploit the long tail. We selected the article *The End of Corporate Computing* by Carr, the former executive editor of the *Harvard Business Review* and business book author, because it presages a future in which IT becomes a utility, much as electricity is today. He argues that IS will operate on a ubiquitous, network-accessed platform. Our final reading focuses on the work of Christensen, founder of an advanced materials company as well as the Boston Consulting Group and a professor at the Harvard Business School. *The Rules of Innovation* captures

the notion that disruptive technologies explain many of the developments that have occurred in IS and IT. In addition, we selected Christensen because the material is not covered elsewhere at our school (see Step 12: Focus on Your Local Strengths). Consequently, the situation presented a wonderful opportunity to expose students to his ideas.

The manner in which these articles are utilized is perhaps as important as which authors we select. First, we leverage the authors' most accessible pieces. For instance, the *New York Times* published an eight-page summary of *The World Is Flat* [Friedman 2005]. Rather than forcing students to digest the entire book, the article version does not present a significant educational barrier for many undergraduate students. Articles are posted and assigned as homework. During class, students take a short quiz to ensure they have read and understood the article. The quiz consists of two parts. The first part contains 10 multiple choice questions, which merely test factual knowledge. In the second part, students answer a short essay question, which asks them to describe the author's background and summarize the main points in the article (we discuss writing more in Step 4 following).

After the quiz, students watch a video of the author discussing the article. Each video was researched in detail to make sure the ideas were presented clearly, concisely, and, most importantly, describe the material from an IS perspective. After the video, students engage in a class discussion, where the main points of the video and article are emphasized. We often introduce emerging technologies to reinforce important aspects of the authors' ideas. For example, when discussing *The End of Corporate Computing*, we utilize applications such as Google Docs to demonstrate the ideas surrounding the utility model of computing. When we move to *The Rules of Innovation*, we revisit the Google applications, which provide the foundation for an insightful discussion of Christensen's notions of sustaining and disruptive technologies. As the semester progresses, the discussion moves towards comparing and contrasting the information and viewpoints captured in the articles. This enables students to form an educated, integrated perspective about contemporary IS issues.

Step 4: Force Students to Write and Write and Write

As indicated by our IS advisory board and recruiters of our IS students, the ability to write well has been repeatedly highlighted as a critical skill needed by IS graduates. Since writing constitutes such an important skill, instructors emphasize writing in the introductory IS course. In addition to improving writing skills, forcing students to write promotes elaboration, which involves "embellishing a to-be-remembered item with additional information" [Anderson 2000, p. 190]. Elaborations can facilitate desirable outcomes for student learning, as well as the development of positive attitudes toward the IS discipline. Studies have shown that individuals who process information elaborately tend to remember the material to a greater extent [Pressley et al. 1987]. This clearly benefits students in the long run, as retained knowledge will serve them in their upcoming careers. Furthermore, consistent with the Elaboration Likelihood Model [Petty and Cacioppo 1986], students who are motivated (e.g., by grades) and have the ability to process information are more likely to develop enduring positive attitudes. We suspect that such processing facilitates positive attitudes toward the IS discipline.

As covered in Step 3 previously, students write about the assigned articles, ensuring they grasp the important material contained therein. In addition to quizzes, we also give four exams. Like quizzes, each exam consists of two parts: a multiple-choice assessment of the material covered in class, and an essay, which focuses on the most recent article covered (except for exam 4, which is a comprehensive exam; see Step 8). We stress two important criteria for essay responses. First, students are informed that a strong emphasis will be placed on writing skills. Second, the content of the essay must demonstrate a thoughtful consideration of the question. Before the first exam, we discuss our expectations concerning writing skills. Each student's essay should have an introduction that lays out the question and the direction the response will take, should have a middle section that makes the argument, and should conclude with a paragraph that brings their thoughts together to a close. Capitalization, spelling, and grammar must be correct throughout, whereas use of slang and colloquialisms is unacceptable. To facilitate the elaborative process, we provide students with the question in advance. Consequently, students can give sufficient thought to their responses ahead of time, rather than feel time pressure to deliver.

To emphasize the importance of writing skills, we also extend writing rules to all e-mail interactions. This is captured in our syllabus, which we cover on the first day of class:

Your messages should be well written and grammatically correct. Furthermore, your messages should begin with a proper salutation and end with a thank you. Written communication skills are extremely important to succeed in business. Therefore, students should be aware that the instructor will reject e-mails that do not comply with the above specifications. In particular, the instructor will not respond to your inquiry directly, but rather advise you to reformat and resubmit the correspondence. As a result, sending unacceptable e-mails will impair your ability to receive a timely response.

Interestingly, as a result of implementing the e-mail policy, the quality of e-mails rose almost instantly to an appropriate professional level. More importantly, we regularly receive comments from faculty colleagues in other departments, as they have noticed a marked improvement in student's e-mail etiquette and the quality of writing. These results seem to hold across time and place.

To make the writing more valuable to the introductory course, the essay on the final exam (exam 4) requires an integrative overview of the four articles they have studied (see Step 3), while making the ideas relevant to them as an undergraduate. The question, given in advance like the other essays, seeks to elicit an integrative response as follows.

During the last semester of your senior year, you are being interviewed by a high-ranking executive of a large company where you would love to work. You have made it through three rounds of interviews and you know that a decision will be made shortly after this last meeting with a member of the senior executive team. You are nervous, as you are one of three finalists for your dream job. The executive is reviewing your transcript and notices one of the courses listed is titled Introduction to Information Systems. After a short pause she says, "Interesting, as you are well aware by the research you have done into our company, we are an information intensive business. Tell me about what you learned in that course."

We ask students to focus their responses on the themes and ideas that emerged from the assigned articles. As discussed in class, responses must be in the form of a complete essay. We believe that giving students the opportunity to articulate an integrated overview of the articles constitutes one of the best ways to ensure that students give the appropriate thought about the essence of the IS discipline, to understand what IS means for them as future managers and individuals, to help students develop enduring memories of the material, and to facilitate positive attitudes toward the IS discipline.

Step 5: Expose Students to Innovative and Interesting Technologies

Enabling students to gain hands-on experience with real IS applications represents a vital tool for learning about the true nature of IS. These activities also play a critical role in converting additional students into IS majors. Students undertake two projects during the semester. The timing of each project maps to the topics covered during that portion of the course. Projects also give students a break from the lecture material. Mixing up pedagogical techniques (e.g., projects, lectures) offers the benefit of enhancing student interest, which has been shown to be the primary mechanism through which aspirations to chose the IS major develop [Akbulut and Looney 2007].

The key aspects of the projects involve clearly describing the objectives of the project, explaining the results that students are expected to achieve, and, most importantly, making students understand the reasons why we are asking them to undertake the project. As noted in Step 2 (Teach IS, not IT or CS), we emphasize the information component of the project and the role IT plays in IS. However, we carefully choose the IT to which students are exposed. The literature suggests that exposing students to innovative technologies can cultivate student interest [George et al. 2005; Looney and Akbulut 2007]. Not only do antiquated technologies provide few opportunities for learning, but they also might not reflect contemporary industry practices. These notions are consistent with the psychology literature, which shows that novelty and complexity pique individual curiosity [Berlyne 1978]. Not only should technologies be novel, but they also should provide an optimal level of challenge. Student interest can wane when technologies are too easy or too difficult to master [Akbulut and Looney 2007].

In the first project, we ask students to create a video resume using Microsoft MovieMaker. This project follows the presentation of *The World Is Flat*, which emphasizes that open sourcing, with communities uploading and collaborating, represents one of the most disruptive forces shaping the flat world, and Anderson, who discusses the importance of user developed content. These articles present an opportune segue into a project that requires students to self-produce content in the form of a video biography. To reinforce the ideas in the articles, students must describe how they are preparing themselves to succeed in a flat world. We also expose students to the business importance of the project by requiring students to read an article about use of video resumes in contemporary recruiting practices [Kitchen 2007].

In line with the key element of focusing on IS rather than IT, we emphasize that we use a Microsoft product purely because of a relationship our school has with Microsoft. We stress that the important issue lies not in which technology students use to complete the project, but the processes that are adopted to complete the project. To this end, we describe the process of storyboarding the video (i.e., contemplating how the story will unfold). Often, we leverage a discussing of the Systems Development Life Cycle to realize this goal. We also discuss issues related to digital rights management and intellectual property rights as they relate to digital media. To help students focus, the project requires the video to address three questions: (1) Who are you? (2) Where do you see yourself in five years? (3) What are you doing to prepare yourself to be a productive member of the global economy in a flat world?



Our second project involves a Web page design project, which students undertake during the last two weeks of class. The timing provides an interesting conclusion to the end of the course, as it allows the students to integrate the materials covered throughout the semester. Although students must use Microsoft SharePoint Designer to complete the project, we again emphasize the school's relationship with the vendor. The goals of this project entail having each student design and build a basic Web presence, and having them experience the ease with which such a task can be completed. Again, rather than focusing on IT, we express that a quality Web page generates business value. As such, students must carefully consider what information to present and the manner in which it is presented.

Step 6: Recruit Peers and Alumni to Serve as Guest Speakers

"Where there are jobs, there are majors!" [George et al. 2005, p. 228]. Despite a growing job market, concerns about outsourcing and a perceived degradation in the job market may pervade the minds of undergraduate students [Looney and Akbulut 2007]. Therefore, we sought to demonstrate the vibrancy of the IS field by exposing students to individuals who have excelled in IS careers. Specifically, we recruited recent IS graduates and current IS majors, who have interned, to serve as guest speakers. Guest speakers are carefully selected. We engaged individuals who are articulate and energetic, and could answer questions from current students. In addition, we recruited individuals who have had interesting experiences, or positions with companies that are well known, well respected, or were viewed by students as "cool."

This step was adopted based on the recommendations of Akbulut and Looney [2007], who recommended exposing students to peers and alumni who have reaped the rewards of the IS field. According to this line of logic, students who see other people, especially peers, excelling in the field of IS are more likely to believe that they can obtain similar rewards. Rather than listening to the instructor talk about the benefits of various IS careers, using peers and alumni can make valuable outcomes more salient to students. The perceived likelihood that favorable consequences will be derived from pursuing the IS major has been shown to directly affect student interest [Akbulut and Looney 2007; Looney and Akbulut 2007].

When using guest speakers in the classroom, a key element involves structuring the discussion. Before a guest speaker arrives, we carefully articulate to the speaker the goals we want to achieve. Foremost, we want the speaker to act as an ambassador for the IS major. In addition, we ask them to describe the rewards that are available to students and to focus the talk on why majoring in IS is relevant, useful, and fun. In our experience, we have found scripting to be unnecessary. Instead, we provide simple guidelines via e-mail a few days before the presentation to enable the speaker to think about the topics to be discussed. We also reinforce the objectives immediately preceding the class.

Over the last few years, the inclusion of our program's more talented students in the recruitment process has had an unintended effect. These students are often members of our Student Information Systems Group (SISG). Upon graduation, these students have typically formed a favorable view of their involvement with this organization. Consequently, several of our graduates who participated in our SISG have created a scholarship that will fund the group's president and vice-president positions in the subsequent year. The scholarships will cover the tuition of the group's officers throughout their one-year obligation. Given student interest thus far, we expect significant competition for these scholarships. We believe these monetary rewards will serve as further enticement to attract the top business school undergraduates to join the major. At the same time, we hope to improve the quality of SISG membership, making it a virtuous cycle of recruitment and scholastic excellence. Of equal importance, our most successful graduates remain invested in the health of our program.

Step 7: Expose Students to Career and Internship Counseling

Helping students realize that fruitful careers await them upon graduation, careers that are interesting and have potential for monetary and personal growth will not only help with student placement, but recruit additional students into the IS major [George et al. 2005]. Further, it is likely that students in the introductory IS course may not know what types of careers and rewards are available as a result of pursuing the IS major. Empirical evidence suggests that the perceived availability of jobs and good salaries promotes student interest in the IS major [Akbulut and Looney 2007].

We execute this step each semester by self-servingly posting two factoids on Blackboard, our course delivery system. First, we display a chart showing the salaries of recent IS graduates vis-à-vis other business majors (usually 40 percent more than the closest alternative). Second, we present U.S. Department of Labor statistics [Hecker 2004], which estimate that IS jobs will grow substantially over the next 10 years. IS-related jobs are among the highest ranked.



In addition, we devote class time to career and internship counselors. The counselors are very appreciative of the opportunity to talk to our students. In return, they are willing to focus their discussion on the core message that we desire (see Step 6 previously). Attendance at business career fairs and other career-related activities outside of class provides opportunities for students to earn extra credit.

Step 8: Provide Sufficient Levels of Assistance to Students

Even the most effective teacher needs to be supported by resources, such as teaching assistants [McGann et al. 2007], to enhance the student-learning experience. This notion is captured in the literature as *instrumental assistance*, which “refers to the degree to which informal pedagogical support is available to help students outside the classroom” [Akbulut et al. 2008, p. 85]. Instrumental assistance has been shown to promote students’ confidence in their ability to tackle the material in an introductory IS course, as well as augment the perceived likelihood that valued rewards will be received by majoring in IS.

Beyond its beneficial effects on student attitudes, the provision of resources provides the necessary support, freedom, and useful feedback to the instructor, who is then able to adapt and react to this information to better serve the students (discussed at more length in Steps 11 and 12 following). Furthermore, research and service requirements constrain the ability of tenure-track faculty to provide detailed levels of assistance to introductory students. Dedicating sufficient time to conduct research can be particularly important for junior faculty, who are vying for promotion and tenure [Dennis et al. 2006].

In addition to teaching assistants, we have found that students helping students facilitates an effective way to provide sufficient levels of instrumental assistance. Students helping students serves the dual purpose of providing much needed assistance, while offering an effective mechanism to attract new students to the IS major. The two projects undertaken during the semester provide a perfect opportunity to implement this approach. Although we provide time in class for students to work on their projects, members of the SISG (mentioned in Step 6) facilitate help sessions outside of class. As a result, students in the introductory IS course gain first-hand exposure to individuals who are currently majoring in IS. Unlike the traditional stereotypes associated with IS personnel [Enns et al. 2006; Joshi and Schmidt 2006], our students typically view SISG members as personable people who will help them during a time of need. Furthermore, students get a chance to imagine themselves in a similar role, improving both their confidence in their capabilities to succeed as an IS major while strengthening their expectations about the favorable consequences of majoring in IS [Akbulut and Looney 2007].

Step 9: Provide Opportunities for Reflective Growth

On the last day of course, we revisit the topic introduced at the beginning of the course: “What is IS?” (See Step 2). Before responding, we allow students to review and reflect on their initial responses. We then ask students to write a few brief paragraphs that provide an updated perspective on the question.

We implemented this step because it enables students to directly observe their growth in understanding over the course of the semester. Such an introspective assessment tends to increase individuals’ confidence in their ability in an achievement area [Bandura 1997]. In particular to IS, students’ confidence in their ability to perform successfully as IS students is strongly related to the development of interest in the IS major [Akbulut and Looney 2007; Looney and Akbulut, 2007].

Student answers demonstrate the effectiveness of this approach, as evidenced by the following snippets:

With the help of these four articles [Friedman, Anderson, Carr and Christensen] I now understand how IS is a major benefit to a successful business.

With the help of these authors and this class, I have learned that the ways that we provide information, how we make it easy and effective to use, and the new and improved technologies that we create to make it all possible are the foundation for Information Systems.

Coming in to this class I assumed it was going to be another class like the CS class I previously took. I now know that IS isn't like CS at all. I am much more interested in the IS major and wouldn't mind pursuing IS as a career.

By taking a small amount of time in class to provide an opportunity for reflective growth, we are able to successfully summarize the material in the introductory IS course, as well as demonstrate to the students how their thinking has evolved without resorting to a lecture.

Step 10: Identify and Market to Top Students

The literature indicates that programs have the ability to affect both the number and demographics of students attracted to the IS major [George et al. 2005]. In terms of numbers, the other 11 steps described herein have proved most efficacious in attracting students to the IS major. In terms of demographics, our goal involves attracting the top students from the introductory IS course to the IS major.

Verbal (or written) persuasion represents an important mechanism through which students can develop confidence in their abilities to perform effectively as an IS major [Akbulut and Looney 2007; Bandura 1997]. In turn, confidence promotes student interest [Akbulut and Looney 2007; Looney and Akbulut 2007]. Relying on cumulative scores earned over the course of the semester, each instructor identifies approximately ten of the top student performers from each section. We then market to these students using a multi-faceted approach. First, students receive a letter from the department chair inviting them to major in IS. Second, the instructor invites students to participate in a discussion with the instructors who teach the other sections of the introductory IS course. The discussion takes place during the last 20 minutes of a class session, ensuring that as many students as possible can attend. Finally, instructors give these students an incentive to participate in the discussion. Although many different mechanisms can be utilized, we give students a break on the final exam. Specifically, in return for their participation, students receive full credit on the multiple choice portion of the last exam.

The letter from the department chair, mailed directly to the students, has proven to be a very effective tool. Students report being highly impressed with the personalized correspondence on letterhead. Many mention that the tactic demonstrates commitment from the department to them as individuals. When we give the top students a break on the final exam, we note that it is because they have already proven themselves as capable to be successful within the IS major. Our offer is simply a way to reward them for their successful efforts. The approach also ensures high levels of participation in the discussion, which we conduct during class to ensure everyone can attend. During the discussion itself, the instructors who teach the other sections address the class. They provide their perspective of the IS discipline, share their experiences as a member of the IS community, and explain the reasons why students should consider pursuing the IS major. Typically, we dedicate 15 minutes for the discussion, and then allow approximately five minutes to answer student questions.

Step 11: Be Nimble

As depicted in Figure 2, the final two steps in the 12-step program to bring about change through the introductory IS course are shown wrapping around the other 10 steps. The depiction serves to represent that all of the preceding 10 steps should be considered in light of these final two steps.

The first of these final two steps entails being nimble. In a rapidly evolving discipline such as IS, it is imperative that programs keep course content current [George et al. 2005]. Otherwise, material can become stagnant and no longer reflect current industry practices. Stale material can have a negative impact on student interest [Akbulut and Looney 2007]. To be nimble, educators must be cognizant of and work with the circumstances that are particular and potentially peculiar to their schools.

Step 12: Focus on Local Strengths

Like the ability to be nimble, focusing on local strengths can transcend any of the other steps. For instance, when it comes to student projects (see Step 5), our school employs a specialist in Geographic Information Systems (GIS), who maintains a key relationship with a major GIS software vendor. In addition, during the summer months, our school rents our computer labs to the U.S. Forest Service, who uses the labs to train their employees on GIS systems. As a result, we are considering implementing a GIS project for our students. Such a project would allow students to access high-end GIS software, using 10 layers of GIS information to make decisions, such as determining where to locate the next McDonalds or Starbucks in town. Although this project would clearly align with our local strengths, the same approach might seriously challenge other IS programs that do not have access to similar resources.

An important resource all programs could leverage is relationships with employers. As we've already noted, "Where there are jobs, there are majors!" [George et al. 2005, p. 228]. Employers not only recruit IS graduates, but can also provide local professionals to serve as guest speakers. Awareness of such opportunities enhances the outcome expectations of potential majors [Akbulut and Looney 2007]. In our program, we experienced early success from this approach by placing two graduates with a prestigious IS consulting firm. Our success was largely based on a relationship between one of our faculty members and the firm. After two months with the firm, we invited these former students to speak to all sections of our Introduction to IS course (see Step 6). We also coordinated with the SIGS to hold other presentations outside of class, as well as conduct one-on-one 15-minute "table time" interviews. This opportunity generated a great deal of excitement within the business school. In the following two years, we

placed an additional 18 students, making our school the largest academic recruitment site for the firm. This is another instance where we have capitalized on our local strengths. Our faculty has several individuals with substantial consulting experience, including one who maintains deep ties with the aforementioned firm.

IV. DISCUSSION

Since implementing the 12-step program described in this paper, we have experienced a twofold increase in students major in IS. The impact necessitated the opening of additional sections of our upper-level required classes. For example, the primary measure of the health of our IS program can be evidenced by the number of students registering in the 300-level database class, which is the first class in which new IS students enroll. Table 1 depicts the number of students in this database class over time. As a reminder, the revised introductory IS course was implemented in the fall of 2006. For comparison, the table also shows the number of students in the required 300-level general business school class, which all students are required to complete irrespective of their major. Although the period of time is relatively brief, the percentage of students majoring in IS since the implementation of the 12-step program has increased dramatically. Moreover, preliminary enrollment data for fall 2008 predict more improvement over the preceding year.

Table 1. The Success of the 12-Step Program as Measured by the Health of the IS Major							
Academic Year	01-02	02-3	03-04	04-05	05-06	06-07	07-08
Number of students in 300-Level Database Class - number of IS majors	87	60	56	48	28	35	76
Number of IS majors as a percentage of students in required 300-Level business school class	18%	14%	12%	12%	8%	8%	20%
Number of students in required 300-Level business school class	484	441	470	402	366	449	381

In terms of the quality of students, the success of the 12-step program can be gauged by the grade point average (GPA) of IS majors over time. Given our focus on attracting the top business students to the major, we would expect to see an increase in the average GPA of IS majors after implementing the program as compared to the average GPA of non-IS majors. Table 2 and Figure 3 depict the changes in GPA over time. Since the implementation of the 12-step program (see 2006-7 and 2007-8), the average GPA of IS majors have increased, while non-IS major GPAs have remained relatively constant. These statistics indicate the success of the 12-step program in attracting the highest quality business students.

Table 2. Average GPA of IS Majors Compared to Average GPA of Non-IS Majors over Time					
Academic Year	2003-4	2004-5	2005-6	2006-7	2007-8
Average GPA IS majors	2.85	2.83	2.75	2.85	2.98
Average GPA Non-IS majors	2.81	2.82	2.81	2.82	2.84

During informal discussions with colleagues at our major conferences over the last few years, we have begun to share the techniques employed in the transformation of our program. We are usually met with the same response: "Tell us more!" Based on these conversations, as well as the overwhelming international interest we have received about our use of Friedman in the introductory IS course, gives us confidence that our 12-step program has a reasonable chance of success in a wide variety of programs. However, two common elements of criticism have been leveled at our approach, which merit discussion: (1) databases are not covered in the class; and (2) the Microsoft Office Productivity tools (e.g. Excel) are not covered in the class.

Databases

We do not cover databases in detail, except to note that databases are fundamental to most organizations and, increasingly, to social applications of technology. A business applications course, which provides a general overview of databases along with a few projects in Microsoft Access, taught by the department of computer science, serves as a prerequisite for our introductory IS course. Colleagues from other universities struggle with the idea of allowing students to complete the introductory IS course without ensuring students possess the capabilities of building a table or querying a relational database. These colleagues assert that our students may never be provided with substantive information about databases.

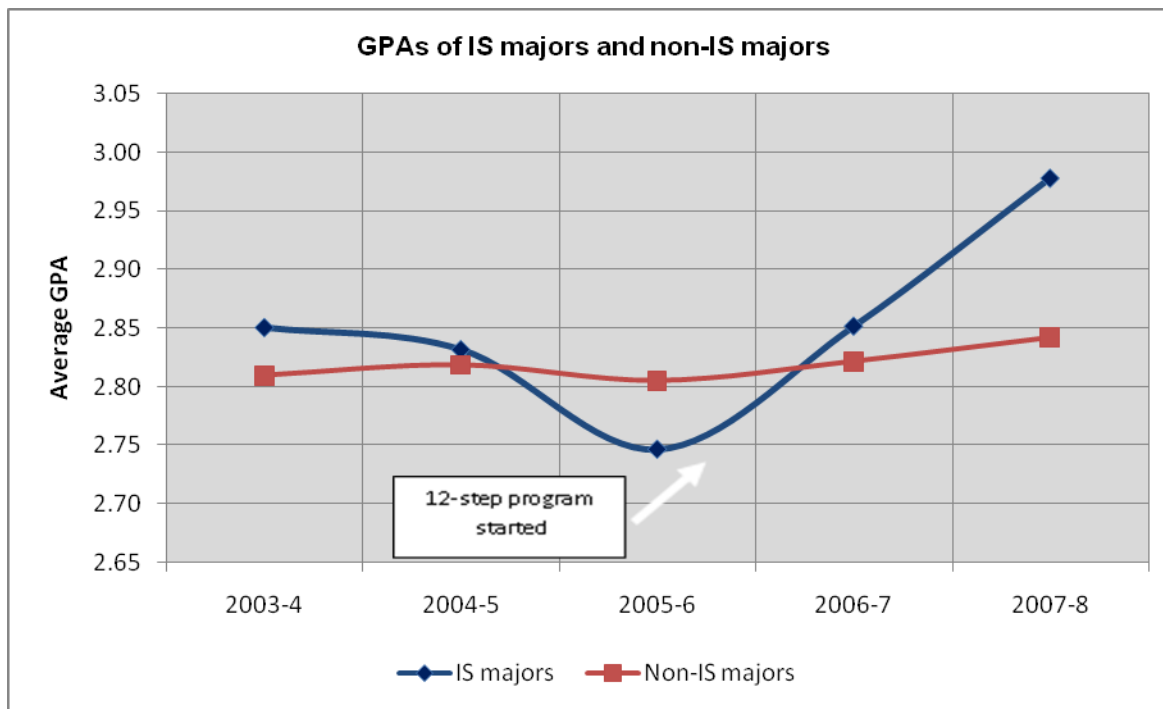


Figure 3. Average GPA of IS Majors Compared to Average GPA of Non-IS Majors over Time

Our response consists of several threads. First, steps 11 and 12 involve being nimble and sensitive to the local environment. We do not claim that our implementation of the 12-step program will fit every institution perfectly. Rather, local circumstances will dictate whether advanced database skills are required beyond the level covered in the applications course. In essence, nimbleness could focus on teaching advanced database topics. For us, we believed that implementing a short “database education” project using Microsoft Access would be akin to the accounting faculty conducting a short project using Intuit’s QuickBooks. Our accounting colleagues have opted against this approach because it would undermine the accounting education as a whole and trivialize the discipline.

Nonetheless, we agree that merely introducing students to the topic of databases would be a disservice to students who will eventually pursue careers in IS. Instead, we use our strategy as a tool to more fully engage the best undergraduate students. Throughout the introductory IS course, we specifically note instances where databases are used to facilitate the flow of information. We then remind students that databases are fundamental to business. Indeed, the use of databases is so widespread that the IS curriculum incorporates a class devoted exclusively to databases, consistent with the IS undergraduate curriculum [Gorgone et al. 2006; Topi et al. 2007]. When our recent IS graduates serve as guest speakers (see Step 6), usually the discussion steers toward the strategic value of information stored in databases. By doing so, we ensure that students think critically about the importance of databases in modern organizations and society.

Microsoft Office Productivity Tools (e.g., Excel)

Developing expertise in productivity tools, such as Microsoft Excel, has been viewed as “tangentially related to the strategic role that information systems play in organizations today” [Ives et al. 2002]. Nonetheless, business graduates need to learn productivity tools in order to be productive members of an organization. The main concern surrounding teaching productivity tools involves when and where to expose students to these applications. In our situation, application basics are covered in the prerequisite to our introductory IS course. However, when we launched our 12-step program, we included a component that sought to advance skills using the Microsoft Office suite. Specifically, we utilized a computer-based learning (CBL) system developed by a book publisher. After two semesters, we dropped the component from our syllabus.

Our decision to include productivity tools was based on a perceived need in the business school to provide students with skills beyond what was covered in the prerequisite applications course. However, we discovered that, despite all the other interesting elements of the course, students typically formed the belief that the IS curriculum focused on learning productivity tools (i.e., IT). Moreover, despite an effort to link IS content and the productivity tools component, a disconnect developed in the minds of our students. Consequently, a decision was made to replace the productivity tools component with the two projects (discussed in Step 5), which more accurately captured the essence of IS rather than IT or CS.

The literature suggests that teaching productivity tools via CBL systems provides a positive learning experience for many students. As a result, implementing such systems may draw additional students to the IS major [Looney and Akbulut 2007]. Nonetheless, students who are familiar with productivity tools prior to entering the introductory IS course are precluded from learning new ideas, meaning that interest in the IS major could wane [Akbulut and Looney 2007].

We recommend that decisions whether to teach productivity tools be considered under steps 11 and 12: Being Nimble and Focusing on Local Strengths. Since dropping the productivity tools component, business school faculty have indicated that some students lack the necessary skills to succeed. The issue seems to be isolated to a small, but nevertheless significant group of students. We are in the process of developing a strategy to combat the issue. For instance, we are considering a productivity tools course in which students can “test out” should they already possess the necessary skills. In essence, fluent students can bypass the course by passing a preliminary test. For the remaining students, we plan on using a CBL system to teach the required principles. Although this approach will allow for self-directed learning, assistants will likely be deployed to administer the course, as well as host tutorial and lab sessions (see Step 8).

When considering the process of implementing the 12-step program, we opted for a three-pronged approach. First, the implementation team created and reviewed all course materials to be delivered. Second, a small subset of course sections was utilized to pilot test the revised material. Finally, we engaged in a cycle of continuous improvement [McGann et al., 2007], which persists today. Looking forward, three areas are being targeted as means to continually improve the course: (1) Web 2.0; (2) wikis, blogs, RSS, etc.; and (3) Second Life and other 3D worlds.

Web 2.0

Although Web 2.0 issues are covered in the Freidman and Anderson articles (see Step 3), a case can be made for covering Web 2.0 in greater detail. For instance, the seminal 2005 article by Tim O’Reilly provides a cogent summarization of Web 2.0 that undergraduate business students could digest [O’Reilly 2005].

Wikis, Blogs, RSS, etc.

We have considered implementing projects (see Step 5) focused on wikis, blogs, RSS, and other Web 2.0 issues. For instance, students could create a Wikipedia entry describing the introductory IS course at our institution. In addition, we are deploying wikis and blogs focused on our current projects, with students earning extra credit for substantive postings. Not only does this strategy engage students in using Web 2.0 applications, but the wikis and blogs also serves as helpful resources for students to utilize while completing the project (see Step 8). The project could also include a component where students research and configure an RSS feed from a company or service that interest them.

Second Life and Other 3D Worlds

The relevance of Second Life and other 3D worlds became clear during the three ICIS 2007 (Montreal) panel sessions devoted to the topic (for a comprehensive overview of the discussions see Mennecke et al. [2008] and Schultze et al. [2008]). Many panelists, such as Blake Ives and Starr Hiltz, noted that these 3D worlds are the beginnings of the 3D web. The current state resembles 1994, when the 2D web was evolving. Following the guidelines of Step 11 (being nimble), a project within a 3D world, such as Second Life, would enable students to actively participate in a virtual experience in which the rules are emerging as the application matures. As described in Step 5, students would need to be appropriately briefed about what to expect and the rationale for undertaking the project. Given the prevalence of highly realistic 3D games, it is important to point out that 3D worlds like Second Life are relatively unsophisticated in terms of graphics and movements, due in large part the early stage of development of the 3D world. Panelists at ICIS 2007 noted that unless the user owns an island, it is impossible to prevent other members from accessing the 3D world. Some members of the 3D world determine the rules of a community by breaking them. For instance, members can appear as distinctly overweight, old, naked men running through a classroom [Stucky 2007]. As such, precautions must be taken to prevent students from being exposed to inappropriate content.

Panelists at ICIS 2007 [e.g., Stucky 2007] noted that while people are making money in 3D worlds such as Second Life, no sustainable business model for commerce in these 3D worlds has emerged. Companies, such as IBM, have already established a business center in Second Life. Nonetheless, Second Life constitutes a part of their broader research and development mission rather than a place to conduct commerce. Indeed, IBM recognizes that 3D worlds may be a difficult place to conduct commerce because of security issues and lack of control (e.g., privacy) over the activities being conducted within the 3D world [Stucky 2007].

As a result, the key to conducting student projects in a 3D world will necessitate appropriately setting student expectations. Not only will it be essential to describe the early stage of development of the 3D world, but also that mechanisms by which commerce can be conducted are in their nascent stages. Projects could center around determining the types of commerce that may be viable or discovering new way in which commerce could be conducted. Faculty at other institutions focus on collaborative projects, such as constructing a building or participating in a class session held at a Second Life location [Ives 2007].

Limitations

As with any research effort, the 12-step program described herein is limited in some respects. Although enrollments have doubled since the implementation of the program, a lack of detailed empirical evidence means that we are currently unable to determine which of the 12 steps were most influential in combating the decline in student enrollments. For instance, we could not assess how many students decided to major in IS due to former students serving as guest speakers. Nonetheless, the literature empirically supports that many of these intervention strategies can and do affect student choice behaviors [Akbulut et al. 2008; Akbulut and Looney 2007; Looney and Akbulut 2007]. Therefore, it seems reasonable to conclude that the intervention strategies contained within the 12-step program contributed to student aspirations to major in IS.

Table 3. Institutions That May Be Using Steps Described in Our 12-Step Program

Step	University	Citation
1. Assign the most effective teachers	Northeastern University	Zack ¹
2. Teach IS, not IT not CS	Emporia State University Oakland University Queen's University Belfast University of Indianapolis The University of Georgia University of Nebraska - Lincoln Utrecht University	Remington ⁵ Mathieson ⁷ Newman ⁶ Flatto ⁵ Goodhue ⁵ Siau ² Helms ⁵
3. Use writings from non-IS authors to tell the IS story	CalTech University of Arizona University of Pittsburgh University of San Diego	Cahalan ³ Duricko ³ Galletta ³ Rebman ⁵
4. Force the students to write and write and write	-	-
5. Expose students to innovative and interesting technology	California State University Domingo Hills Oakland University	Press ⁵ Mathieson ⁷
6. Recruit peers and alumni as guest speakers	Texas Tech University University of Pittsburgh	Walden ² Galletta ³
7. Expose students to career and internship counseling	Long Island University University of Central Florida University of Indianapolis University of Nebraska – Lincoln	Palvia ⁸ Saunders ² Flatto ⁴ Siau ²
8. Provide sufficient levels of assistance to students	-	-
9. Provide opportunities for reflective growth	-	-
10. Identify and market to top students	Georgia State University	Lipp ²
11. Be nimble	CalTech University of Central Florida University of Indianapolis	Cahalan ⁶ Saunders ² Flatto ⁴
12. Focus on local strengths	-	-

¹ "Reversing the Downward Trend: Innovative Approaches to IS/IT Course Development and Delivery," Panel Session, *International Conference on Information Systems*, Montreal, 2007

² "Marketing MIS to Freshman," *IS World posting*, January 2008

³ "Reliability of our core course (was Introduction to IS textbooks)," *IS World posting*, January 2008

⁴ "Intro to IS in junior year," *IS World Posting*, January 2008

⁵ "Introduction to IS textbooks," *IS World Posting*, January 2008

⁶ "What IS & IT do business school students learn? (was: Introduction to IS textbooks)," *IS World posting*, January 2008

⁷ "Dissent on U/G intro MIS course," *IS World posting*, January 2008

⁸ "MIS Discipline: Outlook for Future," *IS World posting*, November 2007

We also acknowledge that the 12-step program may be limited in terms of generalizability. Although the program was implemented in a real academic setting, the site at which the implementation occurred represents a single instance among the entire set of higher education institutions. As a result, at present we cannot ascertain how easily or effectively the program could be implemented in introductory IS courses at other academic institutions. Pedagogical, cultural, and structural differences may preclude the deployment or require alterations to some of the steps described herein. However, we have evidence that several of the 12 steps are being implemented at other universities. Table 3 lists several institutions that appear to be using in their own programs steps similar to those in our 12-step program.

In addition, the introductory IS course is not structured in the same way across institutions [George et al. 2005; Gorgone et al. 2006; Topi et al. 2007]. Some institutions emphasize enterprise resource planning systems in the introductory course [Looney and Akbulut 2007], which we have not captured in our framework. These curricular differences might influence how programs choose to implement the 12-step program. Due to the broad diversity across academic settings, additional research needs to be conducted in different contexts to continually improve the framework.

V. CONCLUSION

The approach to structuring and teaching the introductory IS course described in this paper represents a useful starting point for IS programs striving to curb the sharp decline in IS majors. Although earlier contributions have identified useful intervention strategies, such as the importance of assigning effective instructors to the introductory IS course, our program furthers knowledge by describing holistic approach used to effectively combat declining IS enrollments. The approach employed in our IS program couples effective teachers with a curriculum comprising a diverse array of topics and techniques used to demonstrate that the field of IS equips students with a powerful set of tools for understanding organizations and our increasingly globalized world. The 12-step program provides instructors and administrators with an actionable plan to address the enrollment crisis by reshaping the introductory course found in many IS programs.

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APPENDIX. SUMMARY OF THE 12-STEP PROGRAM TO BRING ABOUT CHANGE THROUGH THE INTRODUCTORY IS COURSE

Step	Summary	Issues to Consider
Assign the most effective teacher.	Research has shown that “students who are taught by effective teachers are more likely to be attracted to the IS discipline” [Looney and Akbulut 2007].	Do not focus on faculty position. Use the best possible IS faculty, irrespective of whether they are tenured, tenure-track, or adjunct.
Teach IS, not IT not CS.	We do a disservice to our discipline by focusing on the technical issues. Focusing on the use of information and how technology enables this use is critical to engaging a broad base of business students.	By considering information and information intensity [Porter and Millar 1985], we free ourselves from the technology, which is ever-changing, and can focus on products, services, business processes, and business relationships, which are ever-present, and ever more pervasive. CS and IT have a vital role in supporting IS. Unless the CS and IT is done right, optimizing the IS piece is impossible.
Use writings from non-IS authors to tell the IS story.	Using non-IS authors to tell the IS story brings external credibility to the story we tell about how important IS is. Use a variety of techniques during this process — a short article, a short quiz to test that the article was read, a video on the topic, a class discussion, a written essay on the exam.	Use a short article by the author, not the whole book. We use: Thomas L. Friedman's “The World is Flat,” <i>NY Times</i> article Chris Anderson's “The Long Tail,” <i>Wired Magazine</i> 12:10 Nick Carr's “The End of Corporate Computing,” <i>MIT Sloan Management Review</i> Spring 2005 Clayton Christensen's “The Rules of Innovation,” <i>Technology Review</i> June 2002.
Force the students to write and write and write.	Writing is such an important skill for IS professionals that we should focus on it as soon as possible. Extend the importance of writing to e-mail interactions with the teacher.	Ensure students know what good writing is. An essay should have an introduction that lays out the question and the direction the paper will take, has a middle section that makes the argument, and a concluding paragraph that brings things together and to a close. Correct spelling and capitalization should be emphasized. Use of slang and colloquialisms is unacceptable. Provide essay and quiz questions in advance, so that there can be thoughtful consideration. Students can then think in advance about what they want to write, rather than be time pressured to deliver.
Expose students to innovative and interesting technology.	Have the students work on two or more projects during class. Clearly lay out the objectives for the project, what the students should achieve, and most importantly the <i>why</i> . Emphasize the <i>information</i> component of what is being done, and how this is part of an information system.	Suggested projects: <ul style="list-style-type: none"> • 2-3 minute video resume project • Web page project • Set up a wiki, blog and RSS feeds • Host a class in a 3D world (e.g., Second Life)
Recruit peers and alumni as guest speakers.	“Where there are jobs, there are majors!” [George et al. 2007]. Show this by having recent graduates come and talk to class.	Don't let the guest speaker “loose” on the class. Brief them on their role: “Be an ambassador of the IS major” and “Show why an IS major is useful and fun.”



	Select students who have had interesting experiences or experiences with companies that are well known, well respected, or just plain "cool."	
Expose students to career and internship counseling.	Helping students realize that there are careers out there for them when they are done, interesting careers, with potential for monetary and personal growth, will help not only with student placement but gain additional students into the IS major [George et al., 2007]. Facilitate this by bringing in career and internship counselors.	Carefully selected and relevant internships are a great way for students to gain experience and have great things to say on their resume and during interviews. Bringing in a well-focused internship counselor can really help the students. Post published statistics that show the vitality of the IS profession.
Provide sufficient levels of assistance to students.	An effective teacher should be supported by a great teaching assistant. A robust Student Information Systems Group (SISG) will show the vitality of the IS major to new business undergraduates. The SISG can host tutorial sessions for the projects (Step 5), and contribute to the success of students within the <i>Introduction to IS</i> class, improving students' self-efficacy and abilities.	Seek out and retain the best TAs you can. Have them give you regular feedback on the students' work. Seek out competent and charismatic leaders for the SISG. Tap into the newly graduated IS alumni network to provide funding and scholarships for the SISG leadership, as well as making it easier for the SISG leadership to host events that will interest non-IS undergraduates.
Provide opportunities for reflective growth.	On the first day of class the students write a short answer to the question "What is IS?" On the last day of class, give them 10 minutes to review their original answer, and have them write a few short paragraphs on "What is IS?" now they've completed the course.	This assignment need not be graded, except perhaps just for attendance.
Identify and market to top students.	Use a multi-pronged approach: (1) A letter sent from the department chair inviting top students to declare an IS major; (2) Students are given a break on the final exam by allowing them to bypass the multiple choice element; and (3) Top students are invited to chat with the <i>Introduction to IS</i> professors during a class session.	Showing the top students that they are respected (by giving them a break on the final exam) allows for near complete attendance for the chat with all the <i>Introduction to IS</i> professors. This session is held during normal class time to make sure that as many students as possible are reached. Have the other IS professors talk about the program and the importance of IS.
Be nimble.	Decide what to press forward with, perhaps unchanged, and what you should wholeheartedly embrace, whatever the cost. Push a little here, give a little there, but make sure that progress is being made.	Work within the constraints of your establishment, and work to change those constraints that hobble progress.
Focus on local strengths.	Focus on your local strengths, be it specialties of the faculty or the needs of local employers. Do whatever it takes to make the IS major interesting and relevant to the broadest number of and best students in class.	Work with employers and your best students to focus on what is interesting and relevant to a large number of students who have yet to select the IS major.



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